Staff Report on Equity and Options Market Structure Conditions in Early 2021

October 14, 2021

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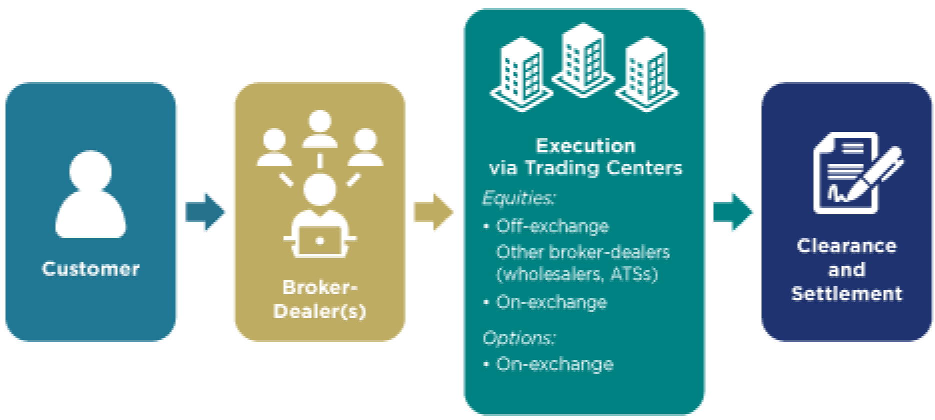
2.1 Equities and Options Market Structure



To understand what transpired in January 2021, it is necessary to understand the market structure within which the events occurred.[2] From the perspective of individual investors, the lifecycle of a stock trade starts with an investor placing an order through an account they establish with a broker-dealer.[3] The broker-dealer then routes the order for execution to a trading center, such as a national securities exchange, an alternative trading system ("ATS"), or an off-exchange market maker.[4] Once a trading center executes the order, the customer receives

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2 <u>See</u>, <u>e.g.</u>, "Staff Report on Algorithmic Trading in U.S. Capital Markets," SEC Staff report (August 5, 2020), Sections II and X, available at: https://www.sec.gov/files/Algo_Trading_Report_2020.pdf.

3 Trading venues can have a wide variety of order types, but there are fundamentally two types: limit orders and market orders. Limit orders specify a price and will stay on an order book until an opposite order comes in that meets or beats that price. Alternatively, market orders are intended to be executed as soon as possible at the best available price.

4 Both ATSs and off-exchange market makers are also broker-dealers registered with the Commission under the Securities Exchange Act of 1934 ("Exchange Act"). Additionally, the first trading center a broker-dealer routes an order to may not execute the order and instead the order may get routed to one or more other trading centers.

a confirmation and the trade is reported to a securities information processor that collects, consolidates, and publishes the price and volume data to market data vendors and others. This processor will publicize the trade details (i.e., that the buyer and seller both report the same security, price, shares, and dollar amount). The trade details are also sent to the clearing broker, who affirms the trade by verifying the trade details. The clearing broker must "settle" an equity trade within two days of the trade date (called "T+2") by officially moving the stock from the seller's brokerage firm's account to the buyer's brokerage firm's account and moving the money from the buyer's brokerage firm to the seller's brokerage firm, a process facilitated by clearing agencies registered with the Commission under the Exchange Act.

Options market structure is broadly similar to equities market structure with several key differences. Specifically, "standardized listed options" are traded only on a national securities exchange, there are a vastly larger number of securities listed and traded, displayed liquidity is primarily derived from market maker quotes, and options settle on the next business day following the trade (T+1). With respect to the number of series of options for each underlying security, there are more than 10,000 listed stocks in the National Market System ("NMS stocks") and more than 1,000,000 options series.[5] Because of the large number of series, there are less likely to be investor limit orders resting on an exchange's order book in any one series at any given time, so prices are commonly set by registered market makers' quotes.

2.2 Overview of the Regulatory Framework

The Commission's mission is to protect investors, maintain fair, orderly, and efficient markets, and facilitate capital formation. In carrying out its mission, the Commission oversees self-regulatory organizations ("SROs") such as the national securities exchanges, the clearing agencies, and the national securities associations (namely, the Financial Industry Regulatory Authority, or "FINRA"), all of whom act as regulators of their broker-dealer members.[6] The

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[5] Options are listed according to a "class," which represents the underlying security (e.g., ABC stock). Within each class, options are listed in series, which denote the options type ("call" or "put"), the strike price, and expiration date. For example, "ABC June $50 calls" refers to a call option on ABC with a strike price of $50 (giving the buyer the right, but not the obligation, to buy 100 shares of ABC stock at $50 on the expiration date in June regardless of the then-current price of ABC stock). Options are priced differently than stocks, as they are expressed as the premium on a per share basis, such that an option with a quote of $2 where one options contract represents 100 shares of underlying stock would cost $200 in premium.

[6] Among other things, the Commission also helps investors gain access to materially complete and accurate information about companies and the securities they offer and sell; oversees investment companies and investment advisers; and investigates and brings civil charges in federal district court or in administrative proceedings based on violations of the federal securities laws.

SROs are subject to the Exchange Act. The Exchange Act includes various rules, requirements, and principles, such as those that prohibit exchanges from engaging in unfair discrimination and require them to promote the protection of investors and the public interest, as well as those that require SROs to file all proposed rule changes with the Commission.

Broker-dealers generally must register with the Commission under the Exchange Act and are subject to the federal securities laws as well as rules of, and oversight by, the SROs of which they are a member. Generally, broker-dealers that deal with the public in securities must become members of FINRA.[7] Broker-dealers are further subject to a number of regulatory requirements, both from the Commission and, as applicable, FINRA and exchanges of which they are a member, including customer account opening obligations, sales practices obligations, and net capital and other financial responsibility rules. A number of these rules and regulations impose obligations with respect to the handling of customer orders. Broker-dealers are subject to certain conduct requirements including the duty of "best execution," which generally requires a broker-dealer to execute customer orders at the most favorable terms reasonably available under the circumstances, generally, the best reasonably available price.[8] In addition, FINRA Rule 5320 (commonly referred to as the "Manning Rule") generally prohibits FINRA members from trading ahead of customer orders (e.g., receiving a customer order to buy and then buying for its own account first at a price that would satisfy the customer's order, without providing the customer with that price or better). Rule 605 and Rule 606 of Regulation NMS require public disclosures regarding order flow. Rule 605 requires a market center (i.e., exchanges, ATSs, and off-exchange market makers) to report data on the quality of executions on its market, while Rule 606 requires broker-dealers to make publicly available on a quarterly basis certain aggregated order routing disclosures for held orders.[9]

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7 See, e.g., Section 15(b)(8) of the Exchange Act, 15 U.S.C. 79o(b)(8) (concerning membership in a registered securities association).

8 See "FINRA Reminds Member Firms of Requirements Concerning Best Execution and Payment for Order Flow," FINRA Regulatory Notice 21-23 (June 23, 2021) (stating that "firms that provide payment for order flow for the opportunity to internalize customer orders cannot allow such payments to interfere with their best execution obligations[,]" and that "inducements such as payment for order flow and internalization may not be taken into account in analyzing market quality.").

9 See infra note 41 (describing Rule 606(a)). See also Securities Exchange Act Release No. 84528 (November 2, 2018), 83 FR 58338, 58340 n.19 (November 19, 2018) (noting that, typically, a "not held" order provides the broker-dealer with price and time discretion in handling the order, whereas a broker-dealer must attempt to execute a "held" order immediately).

2.3 Individual Investors and Retail Broker-Dealers

Individual investors access the markets through accounts at broker-dealers.[10] Broker-dealer customers can open "cash" accounts or "margin" accounts. With a cash account, the customer must pay the full amount for securities purchased. With a margin account, the broker-dealer loans the investor money with the securities in the investor's account serving as collateral. Individual investors in a margin account can use this money to purchase securities, sell securities short, or cover transactions in case their available cash falls below zero (i.e., overdraft).[11]

In order for a customer to trade options,[12] broker-dealers must conduct due diligence that options trading is appropriate for the individual customer. They often do this by requiring customers to obtain specific approval to open an options account, generally through completing an application that asks questions about the customer's investing experience, financial situation, and risk tolerance.[13] Depending on the customer's responses, the broker-dealer may limit the customer to lower levels of options trading representing lower degrees of risk.[14]

Retail broker-dealers have attracted customers by reducing commissions and offering more tools, features, functionality, and convenience to transact. Some use promotional or award programs to attract and retain customers, like offering a free share of stock upon account opening, offering tiered credits for certain levels of deposits or for transferring an account from

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10 See, e.g., "Investor Bulletin: How to Open a Brokerage Account," SEC Office of Investor Education and Advocacy (June 10, 2021), available at https://www.investor.gov/introduction-investing/general-resources/news-alerts/alerts-bulletins/investor-bulletins-43.

11 See, e.g., "Investor Bulletin: Understanding Margin Accounts, SEC Office of Investor Education and Advocacy" (June 10, 2021), available at https://www.investor.gov/introduction-investing/general-resources/news-alerts/alerts-bulletins/investor-bulletins-29.

12 See, e.g., "Investor Bulletin: Leveraged Investing Strategies – Know the Risks Before Using These Advanced Investment Tools," SEC Office of Investor Education and Advocacy (June 10, 2021), available at https://www.investor.gov/introduction-investing/general-resources/news-alerts/alerts-bulletins/investor-bulletins-2. See also Regulatory Notice 21-15, "FINRA Reminds Members About Options Account Approval, Supervision and Margin Requirements" (April 2021).

13 Pursuant to rules of FINRA, a registered national securities association, broker-dealers are required to make such approvals of any customer seeking to trade in options, prior to accepting an order from that customer to do so. See FINRA Rule 2360(b)(16) (Options). See also FINRA Regulatory Notice 21-15, "FINRA Reminds Members About Options Account Approval, Supervision and Margin Requirements" (April 2021).

14 "Investor Bulletin: Opening an Options Account," SEC Office of Investor Education and Advocacy (March 18, 2015), available at https://www.investor.gov/introduction-investing/general-resources/news-alerts/alerts-bulletins/investor-bulletins-77.

another broker-dealer, referral programs, or promotions involving celebrities and online influencers. Some retail broker-dealers have focused on designing simple trading apps that make it easier to trade from anywhere. Some have "social" features that allow customers to discuss stocks and trades and display their trades and portfolios to others. A number of features, which broadly include behavioral prompts, differential marketing, game-like features, and other design elements or features, appear designed to engage individual investors. These features, which have the potential to leverage large amounts of user data, raise questions about their effect on investor behavior that the Commission explored in a recent request for public comment.[15]

Some brokers have sought to attract new customers by offering the ability to purchase fractional shares.[16] Fractional shares give investors the ability to purchase less than 1 share of a stock.[17] Fractional share programs are specific to each broker-dealer, as stocks do not trade on exchanges in units less than 1 share, and trades may only be reported to a trade reporting facility in multiples of one share.[18]

Many brokers have eliminated trading commissions and lowered or eliminated account minimums. While not the first broker-dealer to offer zero commissions, Robinhood Financial, LLC ("Robinhood") attracted considerable attention when it launched its app, allowing users to

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15 See Securities Exchange Act Release No. 92766 (August 27, 2021), 86 FR 49067 (September 1, 2021) (File No. S7-10-21) (Request for Information and Comments on Broker-Dealer and Investment Adviser Digital Engagement Practices, Related Tools and Methods, and Regulatory Considerations and Potential Approaches; Information and Comments on Investment Adviser Use of Technology to Develop and Provide Investment Advice).

16 A number of prominent stocks have share prices that have appreciated to several hundred or even several thousands of dollars per share. When that happens, investors with modest account balances can afford to purchase fewer shares than if the stock was priced below, say, $50 per share. For example, an investor that has $500 to invest could purchase 10 shares at $50 per share, but cannot afford even a single share priced at $1,500.

17 Broker-dealer fractional share programs typically involve the broker-dealer maintaining a separate account in which it either aggregates customers together to form a full share (e.g., one customer buys .25 and another buys .75), or uses its own capital to purchase/sell a full share and give its customer the fraction (e.g., one customer buys .25 and the firm puts the remaining .75 into the special account to satisfy future customer fractional orders). Customers generally cannot transfer these factional shares to another broker-dealer. These programs vary by broker-dealer, and voting or proxy rights depend on the broker-dealer's policies. See "Investor Bulletin: Fractional Share Investing – Buying a Slice Instead of the Whole Share," SEC Office of Investor Education and Advocacy (November 9, 2020), available at: https://www.sec.gov/oiea/investor-alerts-and-bulletins/fractional-share-investing-buying-slice-instead-whole-share.

18 See "Trade Reporting Frequently Asked Questions #101.14," FINRA, available at https://www.finra.org/filing-reporting/market-transparency-reporting/trade-reporting-faq.

trade stocks for no commissions with no account minimums.[19] Other broker-dealers soon followed with apps offering no commissions and no minimums, including Webull Financial LLC,[20] and SoFi Securities LLC.[21] By the fall of 2019, other broker-dealers began to announce zero-commission trading for individual investor customers, including Interactive Brokers LLC,[22] TD Ameritrade, Inc.,[23] E*Trade Financial Corporation,[24] Ally Financial LLC,[25] Charles Schwab Corporation,[26] and Fidelity Investments Inc.[27]

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19 "Start Investing. Stop Paying." Robinhood (March 12, 2015), available at: https://blog.robinhood.com/news/2015/3/11/start-investing-stop-paying.

20 Press Release, "Webull Financial Launches Comprehensive Commission-free Stock Trading App," Webull Financial LLC (May 30, 2018), available at: https://www.prnewswire.com/news-releases/webull-financial-launches-comprehensive-commission-free-stock-trading-app-300656353.html.

21 Press Release, "SoFi Announces Availability of SoFi Money and Invest Products to Help You Get Your Money Right," Sofi Securities LLC (February 26, 2019), available at: https://www.sofi.com/press/sofi-announces-availability-sofi-money-invest-products-help-get-money-right/.

22 Press Release, "Interactive Brokers to Launch IBKR Lite New service to offer zero commissions and no fees," Interactive Brokers Group, Inc. (September 26, 2019), available at: https://investors.interactivebrokers.com/en/index.php?f=45393.

23 Press Release, "The Best Just Got Better: TD Ameritrade Introduces $0 Commissions for Online Stock, ETF and Option Trades," TD Ameritrade Holding Corporation (October 1, 2019), available at: https://www.tdainstitutional.com/content/dam/institutional/resources/press-releases/oct_1_pricing_press_release.pdf.

24 Press Release, "#1 Digital Broker E*Trade Announces $0 Base Rate Commissions For Online Stock, ETF, and Options Trades," E*Trade Financial Corp. (October 2, 2019), available at: https://cdn2.etrade.net/1/19100221100.0/aempros/content/dam/etrade/about-us/en_US/documents/newsroom/press-releases/2019/5545607436705191.pdf.

25 Press Release, "Ally Invest Joins the Zero Commission Movement," Ally Financial Inc. (October 4, 2019), available at: https://media.ally.com/2019-10-04-Ally-Invest-Joins-the-Zero-Commissions-Movement.

26 Press Release, "In Conjunction With Chuck Schwab's New Book "Invested," Schwab Removes the Final Pricing Barrier to Investing Online by Eliminating U.S. Stock, ETF and Options Commissions," Charles Schwab & Co., Inc. (October 1, 2019), available at: https://pressroom.aboutschwab.com/press-releases/press-release/2019/In-Conjunction-With-Chuck-Schwabs-New-Book-Invested-Schwab-Removes-the-Final-Pricing-Barrier-to-Investing-Online-by-Eliminating-U.S.-Stock-ETF-and-Options-Commissions/default.aspx.

27 Press Release, "Fidelity Becomes The Only Firm That Offers Zero Commission Online Trading, Automatic Default To Higher Yielding Cash Option For New Accounts And Leading Trade Execution," Fidelity Investments (October 10, 2019), available at:

Though retail broker-dealers have reduced commissions, some have maintained or increased other sources of revenue, such as: (1) payment for order flow; (2) advisory services or managed accounts from broker-dealers that are dually registered as investment advisers or from affiliated investment advisers; (3) interest earned on margin loans and cash deposits; (4) income generated from securities lending; and (5) fees from additional services. Recent Commission enforcement actions have highlighted some of the conflicts faced by broker-dealers.[28]

Some broker-dealers report that younger investors and smaller accounts have been notable sources of new account openings. For example, Charles Schwab indicated that individual investor customers age 40 and below, with account balances below $100,000, are driving a greater percentage of trading volume than in prior periods.[29] Robinhood reported that its average customer is 31 years old and has a median account balance of $240.[30] Apex Clearing

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https://clearingcustody.fidelity.com/app/literature/press-release/9896568/fidelity-becomes-the-only-firm-that-offers-zero-commission-online-trading-automatic-default-to-higher-yielding-cash-opt.html#:~:text=Insights-,Fidelity%20Becomes%20the%20Only%20Firm%20that%20Offers%20Zero%20Commission%20Online,to%20Investors%20of%20all%20Types.

[28] See, e.g., In the Matter of Robinhood Financial, LLC, "Order Instituting Administrative and Cease-and-Desist Proceedings Pursuant to Section 8A of the Securities Act of 1933 and Section 15(b) of the Securities Exchange Act of 1934, Making Findings, and Imposing Remedial Sanctions and a Cease-and-Desist Order," Securities Exchange Act Release No. 90694 (December 17, 2020) ("Robinhood Order") (settled order), available at: https://www.sec.gov/litigation/admin/2020/33-10906.pdf (discussing the trade-off between payment for order flow and price improvement and how Robinhood took approximately a 20/80 split of the value between price improvement and payment for order flow, which was a substantially higher percentage to Robinhood than the typical 80/20 rate the principal trading firms paid to other retail broker-dealers); and In the Matter of Cantella & Co., Inc., "Order Instituting Administrative and Cease-and-Desist Proceedings, Pursuant to Section 15(b) of the Securities Exchange Act of 1934 and Sections 203(e) and 203(k) of the Investment Advisers Act of 1940, Making Findings, and Imposing Remedial Sanctions and a Cease-and-Desist Order," Securities Exchange Act Release No. 92809 (August 30, 2021) (settled order), available at: https://www.sec.gov/litigation/admin/2021/34-92809.pdf (discussing revenue sharing payments in connection with cash sweep products).

[29] See, e.g., Past CFO Commentary, Charles Schwab & Co. (March 12, 2021), available at: https://www.aboutschwab.com/cfo-commentary/mar-2021.

[30] See, e.g., "Young, confident, digitally connected - meet America's new day traders," Reuters (February 2, 2021), available at: https://www.reuters.com/article/us-retail-trading-investors-age/young-confident-digitally-connected-meet-americas-new-day-traders-idUSKBN2A21GW; and Testimony of Vladimir Tenev, Co-Founder and CEO of Robinhood Markets, Inc., at Sec. IV, Hearing Before the U.S. House Committee on Financial Services (February 18, 2021), available at:

Corporation, a broker-dealer that provides services to other broker-dealers, has indicated that the approximately 6 million accounts it opened in 2020 represent a 137% increase from the year before, with about 1 million of those accounts belonging to investors with an average age of 19.[31]

2.4 Order Execution and Segmentation of Individual Investor Flow

A myriad of market participants and trading venues facilitate the execution of equity and options orders. While customers set the terms of their orders, the retail broker-dealer generally controls where to route the order for execution, subject to a duty of "best execution," discussed above.[32]

For stocks, trades execute either "on exchange" (i.e., on one or more of 16 registered national securities exchanges that list and/or trade stocks, sometimes called "lit" exchanges) or "off exchange" (e.g., on one or more of 34 ATSs that trade NMS stocks or by off-exchange market makers).[33] Exchanges play a central role in price discovery, as the exchange quotes (composed of interest from registered market makers and displayed orders from non-market

https://financialservices.house.gov/uploadedfiles/hhrg-117-ba00-wstate-tenevv-20210218.pdf.

31 See, e.g., "Young, confident, digitally connected - meet America's new day traders," Reuters (February 2, 2021), available at: https://www.reuters.com/article/us-retail-trading-investors-age/young-confident-digitally-connected-meet-americas-new-day-traders-idUSKBN2A21GW.

32 Customers can use "marketable" orders (i.e., an unpriced "market" order seeking an immediate execution at prevailing prices, or a "limit" order with a specified limit price that allows an immediate execution at prevailing prices) or "non-marketable" orders (i.e., an order whose limit price does not allow it to execute immediately but rather must wait until a contra-side order comes to trade with it).

33 National securities exchanges must register with the Commission under the Exchange Act, but off-exchange market makers currently are not subject to specific registration requirements (though they must be registered as broker-dealers). While staff does not know the precise number of broker-dealers that hold themselves out as off-exchange market makers, staff understands from regulatory reports that the segment is highly concentrated with a few particularly dominant firms. See, e.g., infra note 41 (discussing Rule 606 reports).

makers) are the reference price for trades that execute off exchange.[34] Less than 60% of overall equities volume is typically executed on exchanges.[35]

Retail brokers commonly send the orders of their individual investor customers to off-exchange market makers, one example of a practice called "segmentation." For stocks, off-exchange market makers may execute individual investor orders by taking the other side of the trade principally ("internalizing" the trade) or may route the order to other trading venues for execution. For options, off-exchange market makers act as "consolidators" by purchasing individual investor options order flow. They cannot execute that flow off exchange because The Options Clearing Corporation ("OCC") generally only accepts for clearing standardized listed options that traded on an exchange.[36] Instead, they choose the options exchange on which to execute the orders, perhaps based on where they (or an affiliate) are most likely to trade with the order as principal.[37]

Off-exchange market makers have more flexibility compared to on-exchange participants because they are not subject to the rules of the exchanges on which they quote. For example, exchanges are required under Rule 612 of Regulation NMS to price displayed orders for stocks in penny increments, whereas wholesalers can execute more freely in sub-pennies when transacting off exchange. At the same time, off-exchange market makers use the public quotes submitted by on-exchange participants when setting the prices at which they execute individual investor orders off exchange.

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34 Stock prices are reflected in the best priced "bid" (order to buy, e.g., at $10) and the best priced "offer" (order to sell, e.g., at $10.05) resting on exchange order books. The difference between the bid and offer is known as the "bid-ask spread." While each exchange has its own best bid and offer, all such prices across all exchanges collectively enter into the National Best Bid and Offer ("NBBO").

35 See, e.g., "U.S. Equities Market Volume Summary," Cboe Exchange, Inc., available at: https://www.cboe.com/us/equities/market_share/.

36 See, e.g., OCC Bylaws Article I.C(27) (defining "confirmed trade" as one that is "effected on or through the facilities of an Exchange" or "affirmed through the facilities of an OTC Trade Source"). See also "OTC Products," OCC, available at: https://www.theocc.com/Clearance-and-Settlement/Clearing/OTC-Products (noting that OCC offers clearing services for OTC products on S&P 500 index options).

37 Consolidators may be affiliated with, or have an arrangement with, an options market maker. Options exchanges offer consolidators the ability to "direct" orders to an affiliated market maker, and the market maker gets a guaranteed allocation (e.g., 40%) if they are quoting at the best price. Some options exchanges also offer "price improvement auctions," in which a customer order can be exposed for price improvement over the published quotes.

Off-exchange market makers use segmentation to mitigate one of the key risks traders face—prices moving against their positions after executing a trade. Some in the marketplace may possess superior information about underlying asset values and will only buy when posted prices are low relative to their information, and sell when they are high. Other participants may, by virtue of greater quantities of data, have statistically greater predictive ability regarding the direction of prices. Because market makers are more likely to lose money when interacting with such order flow, they have an incentive to distinguish order flow that does not correlate with future price movements from order flow that does. The bid-ask spread, the difference between what a buyer is willing to pay and a seller willing to accept, normally compensates market makers for the risk that prices may move against them.[38] To the extent that market makers can segment order flow that is less correlated with future prices, they can offer a lower spread when trading with this order flow. Besides differing in the motive for trading, such orders are more likely to be small, uncorrelated with one another, and thus "one and done" (i.e., not the first in a series of orders intended to transact a large amount of stock), which also allows for a tighter spread.[39]

Off-exchange market makers typically offer payment to the retail broker-dealer for the right to trade with its customer order flow (i.e., payment for order flow).[40] These payments can create a conflict of interest for the retail broker-dealer. In contrast to fees and rebates charged or paid by exchanges (discussed below), off-exchange payments are individually negotiated prior to

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38 See, e.g., Glosten, Lawrence R. and Paul R. Milgrom (1985), "Bid, Ask, and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders," *Journal of Financial Economics*, 14(1), 71-100.

39 When evaluating price improvement, it is important to note that the NBBO displayed across exchanges does not include many of the best prices available on exchanges, such as odd lots and non-displayed orders. A significant amount of activity transacts at prices within the NBBO (even on exchanges). See Securities Exchange Act Release No. 90610 (December 9, 2020), 86 FR 18596 (April 9, 2021) (File No. S7-03-20) (adopting rule changes concerning a new round lot definition and including odd-lot quotations in core data, which, when implemented, will allow individual investors to see, and more readily access, better-priced quotations). While stocks can execute in a variety of ways, Rule 611 of Regulation NMS generally prevents stocks from executing at prices worse than the NBBO. Additionally, in order to avoid the risks of adverse selection, the smart order routers of executing brokers often break up a large order (often referred to as the parent order) into a number of smaller orders (often referred to as the child orders). A small order may thus be followed by a small order in the same direction, a situation which a market maker would like to avoid. Handling large volumes of orders also provides off-exchange market makers with enormous quantities of data that can be used to design and improve trading and risk management strategies.

40 Payment for order flow is prevalent in the options market, potentially more so than in the equities market, but order flow that is purchased by consolidators is executed on exchange. See supra notes 36-37 and accompanying text.

trading between the retail broker-dealer and the off-exchange market maker,[41] and the rates and amounts can vary substantially depending on the broker-dealer and its customer order flow. Off-exchange market makers may give the retail broker the choice of how to allocate those funds—either by applying some or all of that payment to improve the prices of its customers' orders or by allowing the retail broker-dealer to keep part of the payment for itself.[42]

Most exchanges offer a form of payment for order flow wherein they compensate firms that provide liquidity with rebates and charge firms that take liquidity.[43] For stocks, some exchanges have retail liquidity programs that allow special order types to interact only with designated "retail" orders, which may be supplemented by pricing incentives. For options, these come in the form of "marketing fees"[44] as well as transaction rebates. In contrast to wholesalers (as well as ATSs), pricing incentives offered by equity and options exchanges are considered to be rules of the exchange, so these pricing incentives are subject to the filing requirements of the Exchange Act and must be publicly posted.

While stocks can execute in a variety of ways, Rule 611 of Regulation NMS generally prevents stocks from executing at prices worse than the NBBO. The Commission recently adopted rules that will materially improve the NBBO once those changes are fully implemented, including reducing the size of rounds lots for higher-priced shares and including some odd-lot

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41 Rule 606(a) under the Exchange Act requires broker-dealers to make publicly available on a quarterly basis certain aggregated order routing disclosures for held orders that provide, among other things, detailed disclosure of payments received from or paid to certain trading centers and also requires a discussion of the material aspects of broker-dealers' relationships with those trading centers, including a description of any arrangements for payment for order flow and any profit-sharing relationships and a description of any terms of such arrangements, written or oral, that may influence broker-dealers' order routing decisions. See 17 CFR 242.606.

42 See, e.g., Robinhood Order, supra note 28 (discussing the trade-off between payment for order flow and price improvement and how Robinhood took approximately a 20/80 split of the value between price improvement and payment for order flow, which was a substantially higher percentage to Robinhood than the typical 80/20 rate the principal trading firms paid to other retail broker-dealers).

43 These exchanges are known as "maker/taker" venues, wherein limit orders are paid a rebate by the exchange while market orders pay the access fee to the exchange. Alternatively, "taker/maker" venues give a rebate to market orders and charge limit orders the access fee.

44 Generally speaking, marketing fees are collected by options exchanges from market makers when they trade with "customer" orders, pooled, and paid out by specified market makers to order flow providers to encourage them to send order flow to the exchange.

quotations in core data.[45] However, the availability, particularly for individual investors, of prices better than the national "best" bid (or offer, as applicable) highlights the limitations of relying on the NBBO as the reference point for measuring retail execution quality. For example, it does not include off-exchange liquidity or many of the best exchange prices, such as odd lots and non-displayed orders.[46] A significant amount of activity appears to transact within the NBBO (even on lit exchanges),[47] so price improvement statistics based on the NBBO may overstate the actual price improvement.

2.5 Clearance and Settlement

When retail broker-dealers restricted buying in certain stocks in January 2021, the clearing process, normally in the background, entered the public debate. Clearing agencies act as the central counterparty for almost all equities and options trades in the U.S. markets by functionally serving as the buyer to every seller and the seller to every buyer to lessen the risks associated with one counterparty to the trade failing to perform (i.e., deliver the securities or the money to pay for them).[48] This guarantee is particularly valuable when a stock is experiencing pronounced volatility in its price.[49] Registered clearing agencies are subject to a range of regulatory requirements, including those related to clearing member margin and capital.

Clearing agencies are essential to managing the risk of failure of trades to clear (i.e., the process of transmitting, reconciling, and in some cases, confirming transactions prior to settlement) and settle (i.e., the exchange of money for the securities involved in the trade). The

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45 See supra note 39 (citing to Release No. 34-90610 concerning recently adopted changes for a new round lot definition and including odd-lot quotations in core data).

46 See id. (citing to Release No. 34-90610 concerning recently adopted changes for a new round lot definition and including odd-lot quotations in core data).

47 See, e.g., "U.S. Exchanges Hidden Rate (%)," SEC, available at: https://www.sec.gov/marketstructure/datavis/ma_exchange_hiddenrate.html#.YPc78ehKgq8.

48 There are two main types of registered clearing agencies: depositories and clearing corporations. Depositories—namely, The Depository Trust Company—hold securities certificates for their participants, transfer positions between participants, and maintain ownership records. Clearing corporations—such as the National Securities Clearing Corporation ("NSCC")—often act as intermediaries in making securities settlements, comparing member transactions, clearing those trades, and preparing instructions for automated settlement of those trades.

49 For example, if a buyer executes a trade at $100 per share on Monday, but the price falls to $20 on T+2, the buyer might regret the trade and seek to not follow-through with the purchase. The central counterparty guarantees the seller that the transaction will go through even if the buyer fails to perform.

clearing agency for the U.S. equities markets, NSCC, a subsidiary of the Depository Trust and Clearing Corporation ("DTCC"), maintains a "Clearing Fund" into which its member broker-dealers contribute margin to protect NSCC from potential losses arising from a defaulted member's portfolio until it is able to close out that member's positions. The Clearing Fund consists of required deposits posted by members in the form of cash and eligible securities. Typically, the largest portion of a member's Clearing Fund requirement is the volatility component, which estimates the future risk of the cleared portfolio over a given time horizon at a 99th percentile level of confidence. To determine the volatility component for most securities, NSCC uses a parametric Value at Risk model based on historical price movements. While margin requirements typically change in response to broad-based market movement, the NSCC's margin framework also allows for both intraday mark-to-market calls and additional special charges from clearing members if NSCC observes unusual volatility in specific securities that it believes would present heightened risk to the clearing agency and its members. Pursuant to its existing rules, NSCC can also impose excess capital premium ("ECP") charges for members who present a degree of margin exposure for their cleared positions that exceed those members' excess net capital. ECP charges are "designed to address significant, temporary increases in a Member's Required Deposit based upon any one day of activity."[50] To help members understand their potential required Clearing Fund deposit, NSCC provides certain calculators and information that allow members to monitor their risk and estimate their potential Clearing Fund requirements for actual or hypothetical portfolios.

Similarly, OCC is the clearing agency for listed options for its 16 participant options exchanges. OCC clears and settles listed options trades executed by its clearing members on a proprietary basis as well as for clients. In addition, OCC serves other financial markets, including the commodity futures, commodity options, security futures, securities lending, and the over-the-counter options markets.

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50 See Securities Exchange Act Release No. 79598 (December 19, 2016), 81 FR 94462 (December 23, 2016) (SR-NSCC-2016-005) (Order Granting Approval of Proposed Rule Change to Accelerate its Trade Guaranty, Add New Clearing Fund Components, Enhance its Intraday Risk Management, Provide for Loss Allocation of "Off-the-Market Transactions," and Make Other Changes).